PENGARUH PEMBERIAN KAPUR DAN PROTEIN ADITIF TERHADAP KECEPATAN, BOBOT DAN SIFAT-SIFAT CASTING PADA PENGOMPOSAN KOTORAN SAPI DENGAN TEKNIK VERMICOMPOSTING

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PROGRAM STUDI ILMU TANAH S-1
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Untuk Bapak, Mamah, Kakak-Kakak Dan Adik Bungsuku Tersayang

Serta Seseorang Yang Mulai Berarti
SUMMARY

Euis Marlina. Effect of Lime and Additive Protein on Composting Rate, Weight and Properties of Cow Manure Casting Using Vermicomposting Technique (Santun R. P. Sitorus and Kamir R. Brata as Advisers).

Environmental degradation will increase rapidly if no effort was taken in managing large number of organic waste, as a side product of animal husbandry, to become useful materials. One of the common techniques of waste management is composting. Composting process using earthworm called as vermicomposting.

Earthworm belongs to Omnivor, better live in animal waste and manure, has capability to decompose organic materials 2-5 times faster than any other microorganisms (Harterstein, 1977 in Catalan, 1981). Addition of lime and additive protein (tahu wastes and Gliricidia sp) could increase earthworm activities which means increased composting rates, produced high quantity of earthworm and also increased quality of casting.

The objective of this research is to study effect of lime and additive protein on composting rate, weight and properties of cow manure casting composting using vermicomposting techniques.

The study was conducted at Greenhouse area of the Department of Soil, IPB from December 1999 until July 2000. The materials include cow manure, earthworm (comprises : Lumbricus rubellus, Pheretima sp and Perionyx sp) taken from IPB Darmaga campus, tahu (soybean cake) waste, dried and blended Gliricidia sp leaves, lime and chemical substances used for casting laboratory analysis.

A Completely Randomized Design was used in this study, consists of 10 treatments and 3 repetition, with total of 30 units of experiment. The 10 treatments were combination of two level of lime and five levels of additive protein. Lime treatments comprise without lime (K0) and with lime 1% of dried weight (K1). Protein additive consist of 0% (P0), 5% tahu waste (PA1), 10% tahu waste (PA2), 5% Gliricidia sp leaves (PG1) and 10% Gliricidia sp leaves (PG2), respectively.
Harvesting conducted after all compost materials became casting by separating earthworm and casting. Casting analysis including physical, chemical and biological properties such as pH, CEC, total N, available P, C-organic, K-exchangeable, Ca-exchangeable, Mg-exchangeable, C/N ratio, available water, and respiration rates.

The study results showed that lime application was not significantly increase harvest time, weight of earthworm and casting, however, tend to increase harvest time, weight of earthworm and casting. Lime application was highly significantly increase K and Mg contents of the casting, but decrease total N casting and not significantly difference to the other properties. Besides lime application tend to increase several casting properties such as pH, CEC, respiration value and available water.

Tahu waste application was not significantly difference on composting rate, weight of earthworm, weight of casting and most of other properties, except Mg content. However, tahu waste application tend to increase CEC, K and Ca of the casting.

Gliricidia sp application increased earthworm weight significantly, but not significantly difference for harvest time and weight of casting. The study results also showed that this application was highly significantly increase CEC, Mg, and C-organic of casting but not significantly difference for other properties. Beside that, Gliricidia sp tend to increase pH, P, K, and total N of casting.

Interaction of lime and tahu waste application was not significantly difference on composting rate, weight of casting and weight of earthworm; significantly difference on CEC, total N, Mg content of casting, but not significantly difference for other casting properties.

Interaction of lime and Gliricidia sp application results were as follows : not significantly difference on composting rate, weight of casting and weight of earthworm, significantly increase CEC, Mg of casting and not significantly difference for other casting properties. Beside that, the interaction tend to increase weight of casting, weight of earthworm and K content of casting.
RINGKASAN


Beban pencemaran lingkungan dikhawatirkan akan semakin besar apabila limbah organik dari kegiatan peternakan yang cukup banyak tidak dikelola dan diolah secara baik sehingga dapat berdaya guna. Salah satu cara mengolah limbah adalah dengan menjadikannya kompos. Pembuatan kompos dapat dilaksanakan antara lain dengan bantuan penambahan cacing tanah yang dikenal sebagai vermicomposting.


Penelitian ini bertujuan untuk mempelajari pengaruh pemberian kapur dan protein aditif terhadap kecepatan pengomposan, bobot cacing, bobot dan sifat-sifat casting pada pengomposan kotoran sapi dengan teknik vermicomposting.

Penelitian dilakukan dengan menggunakan Rancangan Acak Lengkap, terdiri dari 10 perlakuan dan tiga ulangan. Kesepuluh perlakuan tersebut merupakan kombinasi dari 2 taraf pemberian kapur dan 5 taraf pemberian protein aditif (ampas tahu dan daun gamal). Dua taraf pemberian kapur tersebut adalah tanpa penambahan kapur (K0) dan penambahan kapur 1% dari bobot kering (K1). Sedangkan 5 taraf pemberian protein aditif adalah 0% (P0), 5% ampas tahu (PA1), 10% ampas tahu (PA2), 5% daun gamal (PG1) dan 10% daun gamal (PG2). Jadi terdapat 10 satuan percobaan dengan ulangan tiga kali, sehingga terdapat 30 satuan percobaan.


Hasil penelitian menunjukkan bahwa pemberian kapur tidak berpengaruh nyata terhadap kecepatan pengomposan, bobot cacing dan bobot casting. Meskipun demikian, pemberian kapur cenderung mempercepat hari panen, meningkatkan bobot cacing dan bobot casting. Pemberian kapur sangat nyata meningkatkan kadar K dan Mg casting, tetapi menurunkan N-total casting dan tidak berpengaruh nyata pada sifat-sifat lainnya. Meskipun demikian pemberian kapur cenderung meningkatkan pH, KTK, nilai respirasi dan air tersedia casting.

Pemberian ampas tahu tidak berpengaruh nyata terhadap kecepatan pengomposan, bobot cacing, bobot casting dan sebagian besar sifat-sifat casting, kecuali kadar Mg. Meskipun demikian, pemberian ampas tahu cenderung meningkatkan KTK, K dan Ca casting.
Bobot cacing meningkat secara nyata dengan pemberian daun gamal, tetapi tidak berpengaruh nyata terhadap hari panen dan bobot casting. Pemberian daun gamal berpengaruh sangat nyata terhadap KTK, Mg dan C-organik casting dan tidak berpengaruh nyata terhadap sifat-sifat lainnya. Namun demikian pemberian daun gamal cenderung meningkatkan pH, P, K, dan N-total casting.

Interaksi pemberian kapur dan ampas tahu tidak berpengaruh nyata terhadap kecepatan pengomposan, bobot casting dan bobot cacing serta berpengaruh nyata terhadap KTK, N-total dan kadar Mg casting, tetapi tidak berpengaruh nyata terhadap sifat-sifat casting lainnya.

Interaksi pemberian kapur dan daun gamal tidak berpengaruh nyata terhadap kecepatan pengomposan, bobot cacing dan bobot casting serta nyata meningkatkan KTK dan kadar Mg casting, tetapi tidak berpengaruh nyata terhadap sifat-sifat casting lainnya. Meskipun demikian, Interaksi pemberian kapur dan daun gamal cenderung meningkatkan bobot cacing, bobot casting dan kadar K casting.
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